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of "the abdominal appendages, which, in Machilis, are movably articulated to the hinder margin of the sterna of the eight antepenultimate somites, a pair to each somite." These as well as similar ones in Scolopendrella, he compares to the exopodite of Decapod Crustacea, notably Peneus, and thinks this an additional argument for the crustacean origin of insects. Now while Mr. Mason has pointed out some interesting points of resemblance between the Crustacea and insects, we do not think that these crustacean features have been derived from the Crustacea; but that they have independently arisen in the ancestral forms of each class. It will be interesting to follow up Mr. Mason's "suspicion that the limbs of myriopods are not strictly homologous with those of insects, but that they correspond with the rudimentary appendages of Machilis, and are consequently exopodites, the appendages of the legs in Scolopendrella representing the legs of insects, which would appear to be endopodites." This may or may not be the case, but we should not desire to fall into the error of drawing too close homologies between two sub-classes like the hexapodous and myriopodous Tracheata (insects).

Finally, our author, after considering the remarkable difference in the position of the genital openings exhibited by the different groups, and very generally by the opposite sexes of Arthropoda, believes this is "intelligible on the hypothesis that all the members of the sub-kingdom have descended from some worm-like creature, provided in every somite of its body with a pair of segmental organs or nephridia, and that different pairs of these organs have, in different descendants of this hypothetical ancestor, been connected in the genital aperture and ducts."

In a paper on the affinity of the genus Polyctenes, Mr. C. O. Waterhouse conclusively proves, by a winged form closely allied to the wingless Polyctenes, that this insect belongs near the Hippoboscidæ, or horse-ticks and bird-flies. In a brief paper on the natural affinities of the Lepidoptera hitherto referred to the genus Acronycta, M. A. G. Butler removes several of the species to the Arctiidæ, a subdivision of Bombycid moths. Our own observations on the structure of the head as well as the general form of the body, made several years ago, lead us to think that such a removal is quite unwarranted, and that the interesting analogies to the Bombycids are superficial, and not fundamental.

RECENT BOOKS AND PAMPHLETS.—Description of four new species of Silurian Fossils. By S. A. Miller. (From Jour. Cin. Soc. Nat. Hist., July, 1880.) 8vo, pp. 5, Pl. 1, 1880. From the author.

The Three Climates of Geology. By C. B. Warring. (From Penn Monthly, June, 1880.) 8vo, pp. 36. From the author.

Contributions to Invertebrate Palæontology, Nos. 2–8. By Dr. C. A. White. (Ext. from the Twelfth Annual Report of U. S. Geolog. Surv., 1878.) 8vo, pp. 171, Pls. 42. From the author.

The Hessian Fly. By A. S. Packard. (Bull. No. 4, U. S. Ent. Com.) 8vo, pp. 43, Pls. 2, Map 1. From the author.

Etude sur les Grenouilles Rousses Ranæ Temporariæ et Descriptions d'Espéces Nouvelles ou Inconnues. Par G. A. Boulenger. (Ext. Bull. Soc. Zool. de France pour 1879.) 8vo, pp. 38. From the author.

The Plowshare. By Henry M. Parkhurst. Vol. XXXII, No. 3. 16mo, July, 1880. From the editor.

On the Zoölogical Position of Texas. By Edw. D. Cope. (From Bull. U. S. Nat. Museum.) 8vo, pp. 51, August 1st, 1880. From the author.

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GENERAL NOTES.

BOTANY.

CONTRIVANCES FOR CROSS-FERTILIZATION IN THE RANUNCULACEÆ.—In Ranunculus the stamens near the honey pores are adnate-extrorse to scatter pollen upon insects as they take honey. The receptacle is elongated to elevate the ovaries and furnish a firm, conspicuous platform, so that insects will first alight upon them. An elongation of the styles simply would not accomplish the purpose.

In Aquilegia the pollen is very rarely if ever discharged till the anthers are beyond the stigmas. As the flowers are pendant this prevents its falling upon the stigmas even if they were prepared to receive it. The spurred petals are placed on all sides of the stamens so that in passing from spur to spur the stamens are almost sure to be brushed. After the stamens have all discharged, the styles then elongate and the feathery stigmas open and curve sidewise so as to bring themselves before the mouths of the petals and at about the same distance at which the anthers were in the staminate stage of the flower.

I have seen humming birds visit the columbines and they seem especially adapted to fertilize them.

In Delphinium one sepal is spurred and two petals are utilized to make the stiff rim for its mouth. Two other petals, or in some species projections from the two already mentioned, serve as a kind of apron to protect the stamens and pistils till each is fully mature. The stamens are first to become so; at which time, by an elongation and bending of the filaments, each anther is brought from under the petals and placed before the mouth of the spur. After discharging pollen, each is withdrawn by a contrary movement of the filament. In a similar way, after the stamens are through, the stigmas are brought into the same position.

In both Aquilegia and Delphinium the outer stamens mature first, the inner meanwhile forming a sheath for covering the pistils. The degrees of complexity in these flowers and the intermediate position of Aquilegia need only to be mentioned to be readily